

## Scenario of Public Health and Environment in Pakistan: A Review

\*Laraib Ehtasham and Rabail Urooj

Department of Environmental Sciences, Sardar Bahadur Khan Women's University, Brewery Road Quetta, Pakistan.

\*Corresponding Author's: E-mail Address [✉: lrb.khilji7@gmail.com](mailto:lrb.khilji7@gmail.com)

Accepted November 19, 2019

The environmental pollution and disturbances are adversely impacting the public health in Pakistan. Pollutants present in air like suspended particulate matter (SPM), carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>) and sulfur oxides (SO<sub>x</sub>) become the cause of various respiratory and cardiovascular diseases. Water pollution affects public (especially children) by causing water-borne diseases like cholera, diarrhea, gastroenteritis, kidney issues etc. Along with these problems, noise pollution is also elevating hypertension and psychological effects (stress, sleep disorders, etc.) in the country. Additionally, exposure to heavy metals and pesticides are also increasing severe diseases and health disruptions, one of which is cancer. Furthermore, the climate change causing droughts, crop yield alteration, Himalayan-Hindukush-Karakoram glaciers melting, floods, temperature elevation and rainfall disturbances in Pakistan is one of the dominant factors affecting the public health. The health impacts caused due to these climatic variations in the country include malnutrition, anaemia, water-borne diseases (cholera, diarrhoea, etc.), and extended outbreaks of vector-borne diseases (dengue, chikungunya, etc.).

**Keywords:** Environment, health, Pakistan, diseases, pollution, climate change.

### INTRODUCTION

Hazardous substances introduced in our environment through natural or anthropogenic pathways lead towards various kinds of adverse impacts on environment and health of human beings (Kampa and Castanas, 2008). Hence, public health and environment are very closely related with

each other as the human health indicates the quality of environment. Total world population is up to 7 billion and it is elevating quickly with passage of time and this rapid increase of human population along with anthropogenic activities is significant global issues and is one of the core reasons of

environmental problems going on in the world. These environmental problems include land-cover changes, climate changes, pollution, etc., which exert stress and negative health impacts on human beings. For example, dams and irrigation projects promote various vector-borne diseases like malaria and schistosomiasis (snail fever). Moreover, climate change including elevated temperatures increase risk of infectious diseases and climate change also increase the frequency of natural hazards (droughts, floods, etc.) which directly or indirectly affect the human health (Myers et al., 2013). Environmental pollution also has damaging impacts on public health, like air pollution alone causes 7 million deaths annually in the world (Landrigan and Sly, 2016).

### **Environmental problems in Pakistan and their impacts on public health**

Pakistan is a South Asian country having arid to semi-arid average climatic condition. It is facing a number of environmental issues and is one of the most vulnerable countries regarding climate change. (Daud, and Zhu, 2017). The urban areas or cities of the country are facing problems of unplanned urban growth, urban congestion, pollution of water and air, improper waste management and noise. On the other hand, rural and side areas of Pakistan are going through deforestation, land degradation, habitat loss, etc., (Khan and Ghouri, 2011). Some of the environmental problems which are affecting public health in the country are mentioned below;

#### **Air pollution and public health**

Air pollution is a very common and major environmental issue in Pakistan and it is adversely affecting public health and quality of life by causing various diseases and life threats in the country (Khan and Ghouri, 2011). For example, it is estimated that due to excessive suspended particulate matter (SPM) in atmosphere of Quetta (capital city of Balochistan province), up to 2000 premature deaths occurred in 2004 (Ilyas et al., 2010). The dominating air pollutants in Pakistan are carbon monoxide (CO), sulfur oxides (SO<sub>x</sub>), nitrogen oxides (NO<sub>x</sub>), particulate matter (PM) etc. PM is one of the most dominant atmospheric pollutants in the

mega cities of the country (specifically the mega cities of Punjab province) where it is one of the major sources of cardiovascular diseases and other kinds of mortality. For instance, PM<sub>10</sub> released from vehicles cause stress, pulmonary diseases and cardiovascular disorders among the public of these mega cities. Moreover, other pollutants like CO, SO<sub>x</sub> and NO<sub>x</sub> also cause adverse health impacts like asthma, breathing difficulties, heart diseases, etc., in these cities because the concentration of these pollutants have exceeded the permissible limits of NEQs in these regions (Tabinda et al., 2019). Furthermore, indoor air pollution specifically is a serious problem in Pakistan which mainly occurs due to the use of biomass fuel for energy followed by smoking and other reasons. It is estimated that 28,000 people die and 40 million people face acute respiratory diseases annually in the country due to indoor air pollution (Colbeck et al., 2010).

#### **Water pollution and public health**

Technological advancement, industrialization and defects in sewerage system have become the core reasons of incorporation of chemical, biological and physical impurities in the water bodies in Pakistan and hence elevated the water pollution in the country. Water-borne diseases in Pakistan include typhoid, diarrhoea, cholera, kidney problems intestinal worms, gastroenteritis, etc. The seriousness of the water pollution threats can be identified from the estimates according to which poor quality of drinking water is the reason of almost 50% diseases and 40% deaths in the country (Daud, and Zhu, 2017). About 79% water in Pakistan is not safe for drinking which initiate a number of water-borne diseases especially in children. The country faces annual deaths of 250,000 children due to water-related diseases and also faces loss of 1.6 million DALYs (Disability Adjusted Life Years) due to typhoid and diarrhea on annual basis. According to some estimates, 20 to 40 percent of beds in hospitals of Pakistan are occupied by the patients facing water-borne diseases (Jabeen et al., 2015). Water pollution also affects public health in the country through irrigation when polluted water incorporates with the water used for irrigation. For example, in Punjab (province having maximum agriculture in Pakistan) municipal

and industrial effluents containing various pollutants often incorporate into drainage system of irrigation and become cause of various adverse health impacts among public (Ashraf et al., 2010).

### Noise pollution and public health

Noise is also a serious environmental issue along with physical, chemical and biological pollutants prevailing in our environment. Increasing traffic, urbanization and industrial activities result in a number of health problems and affect the hearing capabilities of public. A study conducted in Hyderabad (a city of Sindh province), the hearing capacity of rural public is much better than urban public (Shah et al., 2019). This shows that the more population and more industrial activities lead towards much more noise-related health impacts. In Pakistan, noise is affecting public's health adversely by causing various psychological problems like sleep disorders, stress, annoyance, etc., (Ilyas et al., 2010). Moreover, noise pollution is also leading the Pakistani public towards a number of physical health impacts like elevation of chances of prehypertension and hypertension which increases when the noise level is up to 81dBA or even more (Nawaz and Hasnain, 2010).

### Heavy metals and their health impacts

Heavy metals from various industrial sources are contaminating the soil/land, water bodies, and air (Khan and Ghouri, 2011). A lot of heavy metals like arsenic, lead, cadmium, copper nickel, manganese chromium, etc., contaminate surface water bodies, groundwater, soil and vegetables in Pakistan. These heavy metals exceed the NEQs levels in most of regions of the country and hence cause toxicity and various health impacts among public. For instance, Manchar Lake in Sindh containing high arsenic concentration led towards chronic arsenic toxicity and high lead levels in Karachi elevated hypertension especially in traffic constables (Waseem et al., 2014). On the other hand, the products like cosmetics being widely used in the country also contain high concentrations of iron, zinc, lead and copper and are creating health hazards for the people using those (Hussainullah, 2017).

### Pesticides and their health impacts

The use of pesticides in Pakistan was initiated in 1954 and with the passage of time their use has been increased in the country. This excessive use of pesticides (including DDT, PCBs, Triazine herbicides, etc.) is becoming a threat for public's health. One of the most dreadful impacts of these pesticides is disruption of endocrine system and various kinds of cancer including breast, thyroid, ovarian, prostate and testicular cancer (Ejaz et al., 2004). During a research in Swat (a city in Khyber Pakhtunkhwa/KPK province), it was found the people having occupational exposure to pesticides, had low levels of hemoglobin in their blood. Additionally, they were also facing problems of their kidneys and liver functioning (Khan et al., 2013). Another study held in District Swabi (in KPK) revealed that farmers working in tobacco fields exposed to pesticides were facing a number of health impacts like breathing problems, weakness of muscles, dizziness, headache, etc., (Khan et al., 2010).

### Climate change and its health impacts

Pakistan is very vulnerable and sensitive towards climate change mainly because of its geographical location and various other factors. This climate change is elevating temperature, melting the glaciers of Hindukush, Himalaya and Karakoram ranges disturbing rainfall patterns in the country (Rasul et al., 2012).

Balochistan is the most vulnerable province of the country and experiencing drought and increase in temperature, whereas Punjab is facing frequent floods and Sindh is facing drought and floods both due to climatic variations. These conditions are affecting the health of Pakistanis in a number of ways, like floods are increasing the cases of diarrhea, gastroenteritis, infections, acute respiratory problems, etc., whereas drought is causing anemia, malnutrition food insecurity, night blindness etc. The increasing temperature in the country is causing cardiovascular problems, heat strokes and various vector-borne diseases like malaria and dengue (Malik et al., 2012). Dengue which is a fatal vector-borne disease increase due to climatic changes, population explosion and unplanned urban growth because the mosquito (*Aedes aegypti*) causing this disease mostly grows in

warm areas and population dense areas. The outbreak of dengue in Pakistan which occurred in 2011 was expanded due to the abnormal increase in temperature, heavy rainfall and flooding of 2010-2011 (Khalid and Gaffar, 2015). This same mosquito causes some more diseases, one of which is chikungunya. The outbreak of chikungunya in 2016 in Pakistan which affected thousands of people is said to expand due to climatic changes, unplanned urbanization, poor sanitation and some other factors (Mallhi et al., 2017). Furthermore, all these factors of droughts, floods, increasing temperature and precipitation variability are altering crop yield in Pakistan that is estimated to lead towards food shortage by 2030 which will definitely affect the nutritional health of the public (Ahmed et al., 2016).

## CONCLUSION

As the environmental disturbances including pollution, exposure to hazardous substances and climatic variations are badly affecting the public health and causing enormous diseases in Pakistan, hence it is the urgent need that there should be proper and functional implementation of measures to control impacts of these problems. In this regard, implementation of Pakistan Environmental Protection Act, 1997 (PEPA), NEQS and other regulatory guidelines established for environmental improvement are needed to be implemented and adopted in full means. Moreover, public should be made well-informed and their adaptive capacity for coping with negative impacts of environmental issues on their health should be enhanced. As Pakistan is a developing country, so improving its socio-economic conditions has the strong potential to improve its resilience towards environmental.

## RECOMMENDATIONS

The environmental issues affecting the public health are the burning issues in Pakistan which need be addressed. It is recommended to work on the identification of the identification of the issues along with the solutions/steps required for their minimization. Moreover, the need for identifying the possible solutions of environmental problems on every level (individual, community, governmental or national) of the citizens of the country is needed be

addressed.

## REFERENCES

- Ahmed T, Scholz M, Faraj FA and Niaz W (2016). Water-Related Impacts of Climate Change on Agriculture and Subsequently on Public Health: A Review for Generalists with Particular Reference to Pakistan. *International Journal of Environmental Research and Public Health*, 13: 1-16.
- Ashraf MA, Maah MJ, Yusoff I and Mehmood K. (2010). Effects of Polluted Water Irrigation on Environment and Health of People in Jamber, District Kasur, Pakistan. *International Journal of Basic and Applied Sciences*, 10 (3): 37-57.
- Colbeck I, Nasir ZA and Ali Z (2010). The state of indoor air quality in Pakistan - A review. *Environmental Science Pollution Research*, 17:1187–1196.
- Daud MK and Zhu SJ (2017). Drinking Water Quality Status and Contamination in Pakistan. *BioMed Research International*, 1: 1-18.
- Ejaz S, Akram W, Lim CW, Lee JJ and Hussain I (2004). Endocrine Disrupting Pesticides: A Leading Cause of Cancer among Rural People in Pakistan. *Experimental Oncology*, 16 (2): 98-105.
- Hussainullah AI (2017). Comparative study of heavy metals content in cosmetic products of different countries marketed in Khyber Pakhtunkhwa, Pakistan. *Arabian Journal of Chemistry*, 10: 10-18.
- Ilyas SZ, Khattak AI, Nasir SM, Qurashi T and Durrani R (2010). Air pollution assessment in urban areas and its impact on human health in the city of Quetta, Pakistan. *Clean Technology Environmental Policy*, 12: 291–299.
- Jabeen A, Huang X and Aamir M (2015). The Challenges of Water Pollution, Threat to Public Health, Flaws of Water Laws and Policies in Pakistan. *Journal of Water Resource and Protection*, 7, 1516-1526.
- Kampa M and Castanas E (2008), Human health effects of air pollution. *Environmental Pollution*, 151 (2): 362-367.
- Khalid B and Ghaffar A (2015). Environmental risk factors and hotspot analysis of dengue distribution in Pakistan. *International Journal of*

- Biometeorology, 59: 1721–1746.
- Khan AA, Shan MA and Rahman SU (2013). Occupational Exposure to Pesticides and Its Effects on Health Status of Workers in Swat, Khyber Pakhtunkhwa, Pakistan. *Journal of Biology and Life Science*, 4 (2): 43-55.
- Khan DA, Shabbir S, Majid M, Naqvi TA and Khan FA (2010). Risk assessment of pesticide exposure on health of Pakistani tobacco farmers. *Journal of Exposure Science and Environmental Epidemiology*, 20: 196–204.
- Khan MA and Ghouri AM (2011). Environmental Pollution: Its Effects on Life and Its Remedies. *Journal of Arts, Science and Commerce*, 2 (2): 276-285.
- Landrigan PJ and Sly PD (2016). Health Consequences of Environmental Exposures: Changing Global Patterns of Exposure and Disease. *Annals of Global Health*, 82 (1): 10-19.
- Malik SM, Awan H and Khan N (2012). Mapping vulnerability to climate change and its repercussions on human health in Pakistan. *Globalization and Health*, 8: 1-10.
- Mallhi TH, Khan YH, Khan AH, Tanveer N, Khan OH and Aftab RA (2017). Commentary: Outbreak of Chikungunya in Pakistan. *Frontiers in Public Health*, 5: 1-2.
- Myers SS, Gaffikinc L, Goldenb CD, Ostfeldd RS, Redforde KH, Rickettsf TH, Turnerg WR and Osofsky SA (2013). Human health impacts of ecosystem alteration. *PNAS*, 110 (47): 18753–18760.
- Nawaz SK and Hasnain S (2010). Noise Induced Hypertension and Prehypertension in Pakistan. *Bosnian Journal of Basic Medical Sciences*, 10 (3): 239-244.
- Rasul G, Mahmood A, Sadiq A and Khan SI (2012). Vulnerability of the Indus Delta to Climate Change in Pakistan. *Pakistan Journal of Meteorology*, 8 (16): 89-107.
- Shah T, Warsi J, Mahar B and Ansari S (2019). The Comparison of Hearing Capabilities and Blood Pressure with Reference to Noise Pollution in Rural/Urban Areas of District Hyderabad. *Journal of Liaquat University of Medical Health Sciences*, 18 (2): 142-145.
- Tabinda AB, Ali H, Yasar A, Rasheed R, Mahmood A and Iqbal A (2019). Comparative Assessment of Ambient Air Quality of Major Cities of Pakistan. *MAPAN-Journal of Metrology Society of India*, 1: 1-8.
- Wasem A, Arshad J, Iqbal F, Sajjad A, Mehmood Z and Murtaza G (2014). Pollution Status of Pakistan: A Retrospective Review on Heavy Metal Contamination of Water, Soil, and Vegetables. *BioMedical Research International*, 1: 1-29.